

Studies on the Renal and Cardiovascular Effects of Electromagnetic Field Exposure in Rats

Thesis

*Submitted in partial Fulfillment of M.D. Degree in Basic
Medical Science (Physiology)*

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2011

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَ الَّذِينَ
أَوْتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ
خَبِيرٌ*

صَدَقَ اللَّهُ الْعَظِيمُ

الآية رقم (١١) سورة المجادلة

To My Family

دراسة تأثير التعرض للموجات الكهرومغناطيسية على وظائف الكلي والجهاز الدوري في الفئران

رسالة مقدمة من

الطبيبة/ نهى نوح لاشين

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ACKNOWLEDGEMENT

First and foremost, I thank “*ALLAH*” who gave me the strength to fulfill this work, as a part of his generous help throughout my life.

I would like to express my sincere gratitude and deepest thanks to *Prof. Dr. Fatma Ahmed Mohamed*, Professor of Physiology, Faculty of Medicine, Ain Shams University, for initiating, suggesting, planning this work and for her meticulous supervision, helpful scientific support, unlimited help and continuous guidance throughout the whole work. Indeed, I am very privileged and honored to have worked under her supervision.

Also, I am greatly honored to express my utmost thanks to *Prof. Dr. Azza Abdel-Hameed Ahmed*, Professor of Physiology, Faculty of Medicine, Ain Shams University for her great support and assistance throughout this work.

I am profoundly grateful to *Dr. Bataa Mohamed Aly El Kafoury*, Assistant Professor of Physiology, Faculty of Medicine, Ain Shams University for her expert guidance, keen supervision and sharp interest throughout the entire work. Without her help and support this work could not have been possible.

I would like to thank *Dr. Gehan Ibrahim El-Salamony*, Assistant Professor of Physiology, for her unfailing assistance and for her support.

I would, also, like to extend my thanks and appreciation to *Prof. Dr. Manal Hassan*, Professor of Histology and *Dr. Hanan Mohamed Alaa*, Assistant Professor of Histology, Faculty of Medicine, Ain Shams University, for their contributions in the histological examinations included in the present study.

I would like to offer special thanks to *Prof. Dr. Faten Diaab*, Head of Physiology Department, Faculty of Medicine, Ain Shams University, for her great support and encouragement.

I would, also, like to thank all members of the Physiology Department for their cooperation and support.

Last but not least, I would like to express my deepest gratitude to my family, who helped and supported me throughout this work.

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List of Abbreviations

ABP: Arterial Blood Pressure.

ACTH: Adreno-Corticotropic Hormone.

ADA: Adenine Deaminase.

ADHD: Attention Deficit Hyperactivity Disorder.

BUN: Blood Urea Nitrogen.

CAPE: Caffeic Acid Phenethyl Ester.

CAT: Catalase.

EHS: Electromagnetic Hypersensitivity.

ELF: Extremely Low Frequency.

ELFMF: Extremely Low Frequency Magnetic Fields.

EMFs: Electromagnetic Fields.

EMR: Electromagnetic Radiation.

GH: Growth Hormone.

GSH: Glutathione reduced.

GSH-Px: Glutathione Peroxidase.

GSM: Global System for Mobile Communication.

HR: Heart Rate.

HRV: Heart Rate Variability.

IEI-EMF: Idiopathic Environmental Intolerance with
Attribution to Electromagnetic Fields.

MDA: Malondialdehyde.

NAG: N-acetyl- beta-d- glucosaminidase.

NO: Nitric Oxide.

PRA: Plasma Renin Activity.

RF: Radiofrequency.

RF/MW: Radiofrequency Microwave.

RF-EMR: Radiofrequency Electromagnetic Radiation.

RF-EMWs: Radiofrequency Electromagnetic waves.

RFFs: Radiofrequency Fields.

RFR: Radiofrequency Radiation.

RIA: Radioimmunoassay.

ROS: Reactive Oxygen Species.

SAR: Specific Absorption Rate.

SMF: Static Magnetic Field.

SOD: Superoxide Dismutase.

T₃: Triiodothyronine.

T₄: Thyroxine.

TBA: Thiobarbituric Acid.

TCAA: Trichloroacetic acid.

TSH: Thyroid Stimulating Hormone.

UV: Ultra Violet.

W/Kg: Watt per Kilogram.

XO: Xanthine Oxidase.

Introduction

The use of cell phones is currently one of the fastest growing technological developments, and, together with the increasing number of associated base stations, have become a widespread source of non-ionizing electromagnetic radiation (EMR) (**Oktem et al., 2005**). **Ozguner et al. (2005_{a,b,c,d,e})** stated that electromagnetic fields (EMFs) are a documented form of stress, and could possibly, therefore, have detrimental health effects. Further, **Yurekli et al. (2006)** reported that some biological effects were likely to occur even at low-level EMF.

Bortkiewicz (2001) had proposed that the growing number of cell phone users and numbers of inhabitants living in the vicinity of base stations would raise the interest in studying the effects of emitted electromagnetic fields on living organisms.

Health endpoints reported to be associated with extremely low frequency and/or radiofrequency include childhood leukaemia, brain tumors, genotoxic effects, neurological effects and neurodegenerative diseases, immune system deregulation, allergic and inflammatory